The contents of a rabbit's stomach were digested in distilled water, and the clear portion of liquid thus obtained divided into four parts. The first was evaporated to dryness, and the quantity of muriatic acid present in the residuary fixed salts determined by nitrate of silver; the second was supersaturated with potash, evaporated and decomposed by nitrate of silver as before, by which the total quantity of muriatic acid in the fluid was ascertained; the third was neutralized by a solution of potash of known strength, and the required quantity accurately noticed. This gave the proportion of free acid present; and by adding this to that in union with a fixed alkali, as above determined, and subtracting the sum from the total quantity of muriatic acid present, the proportion of acid in union with ammonia was estimated. But as a check to this result, the third neutralized portion was evaporated to dryness, and the muriate of ammonia expelled by heat; the quantity of muriatic acid left in union with the fixed alkali was then determined as before; and by subtracting this from the total quantity, the quantity in union with ammonia was determined.

From such experiments the author concludes, that no inconsiderable quantity of unsaturated muriatic acid exists in the stomachs of animals during digestion; and from the examination of the fluid ejected from the human stomach in a case of dyspepsia, he infers that there also the muriatic acid performs the same office.

*On the North Polar Distances of the principal fixed Stars.* *By* John Brinkley, *D.D. F.R.S. &c. Andrews Professor of Astronomy in the University of Dublin.* Read December 18, 1823. [*Phil. Trans.* 1824, *p.* 50.]

The author observes, that of the recent catalogues that have been formed of the principal fixed stars, two, those of Dublin and Greenwich, agree very exactly. That of M. Bessel differs considerably; but the differences are such that they would agree by a modification of the co-efficients of refraction employed for correcting the observations. Mr. Pond, he says, has applied the refractions of Bradley to the instrument of Dublin; he himself thinks it more safe to determine the refraction for each place from its own instruments; and he objects to the reasoning by which Mr. Pond has endeavoured to prove the existence of a flexure in the tube of the instrument of Dublin.

Dr. Brinkley makes the mean difference of the stars of Greenwich and Dublin for 1813 only a few tenths of a second; for 1823, still less. Neither the Dublin Catalogue, nor any other more extensive comparison, affords, in his opinion, a confirmation of the hypothesis of a general southern motion, which he is therefore inclined to attribute principally to a slight inaccuracy of the Greenwich Catalogue for 1813.

The comparisons unfavourable to the southern motion are those of Bradley's observations at Wanstead, in 1728; and some French ob-

servations, in 1740; of Maskelyne's at Schehalien, in 1774; General Mudge's, in 1802; and General Lambton's, in 1805; as well as of Piazzi's Catalogue. Mr. Pond's observations at Westbury agree too little with the Catalogue of Greenwich, he thinks, to be of any use in the inquiry; and Mechain's are opposed to others made by better instruments.

Dr. Brinkley does not think it an argument in favour of Bessel's refractions, that they give the obliquity of the ecliptic the same for both solstices; he rather supposes some particular equation is required for the solar refraction, Bessel's refraction at low altitudes being manifestly too large for the stars.

The question of parallax Dr. Brinkley still reserves for future discussion.

*On the Figure requisite to maintain the Equilibrium of a Homogeneous Fluid Mass that revolves upon an Axis.* *By* James Ivory, *A.M. F.R.S.* Read December 18, 1823. [*Phil. Trans.* 1824, *p.* 85.]

The author enumerates the various steps by which Sir Isaac Newton, M^c^Laurin, and Laplace have carried the theory of the equilibrium of a revolving fluid very near to perfection, but he observes that they have generally supposed the spheroid to differ but little from a sphere; and he proceeds in the present paper to investigate the figure "by a direct analysis, in which no arbitrary supposition is admitted."

Mr. Ivory thinks it necessary to distinguish carefully two separate cases; the first is when the particles of the fluid do not attract one another, and the second when the particles are endued with attractive powers. These, he says, are plainly two cases that are essentially different from one another; for in the first, a stratum added induces no other change than an increase of pressure caused by the action of the accelerating forces at the surface; but in the second, besides the pressure, a new force is introduced, arising from the mutual attraction between the matter of the stratum and the fluid mass to which it is added.

Mr. Ivory gives two different methods of investigating the fundamental laws of this equilibrium, the one which is the newest and most simple being contained in two propositions.

First, If a homogeneous fluid body revolving about an axis be in equilibrio by the attraction of its particles, any other mass of the same fluid having a similar figure, and revolving in the same time about an axis similarly placed, will likewise be in equilibrio by the attraction of its particles.

The proof is easily deduced from the well known properties of an attraction inversely proportioned to the square of the distance.

Secondly, If a homogeneous fluid mass revolve about an axis, and be in equilibrio by the attraction of its particles, all the level surfaces will be similar to the outer surface; and any stratum of the fluid contained between two level surfaces will attract particles in the in-